United States General Accounting Office

GAO

Report to the Chairman, Subcommittee on Defense, Committee on Appropriations, House of Representatives

August 1999

DEFENSE ACQUISITIONS

Reduced Operational Effectiveness of Joint Standoff Weapon

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United States General Accounting Office
Washington, D.C. 20548

National Security and
International Affairs Division

B-280931

August 31, 1999

The Honorable Jerry Lewis
Chairman, Subcommittee on Defense
Committee on Appropriations
House of Representatives

Dear Mr. Chairman:

This letter responds to your request that we review selected antiarmor weapons that are currently being developed and procured. The request follows up on concerns expressed in the Subcommittee's report accompanying the fiscal year 1999 Defense Appropriations Bill.[1] In that report, the Subcommittee expressed concerns with the Cold War mind-set of the services in continuing to develop and procure an increasing number of tank-killing weapons.

This report examines the Navy's and the Air Force's development of the Joint Standoff Weapon (JSOW). JSOW is an air-to-ground missile expected to provide improved capabilities to hit targets from greater distances than many current weapons. JSOW has three warhead variants—wide area, antiarmor, and unitary. Current plans call for procuring a total of 19,000 missiles at an estimated production cost of $5 billion. As requested, we reviewed JSOW to determine whether (1) the missile will provide capabilities originally intended and (2) cost and operational effectiveness analyses continue to support the program's procurement plans.

As agreed with your office, we are reporting separately on your related request that we review (1) armor threat changes and the impact on antiarmor weapons acquisitions[2] and (2) the Department of Defense's (DOD) congressionally mandated Antiarmor Weapons Master Plan.

[1]H. Report. 105-591, Report of the Committee on Appropriations together with Dissenting Views, June 22, 1998, to accompany Department of Defense Appropriations Bill, 1999.

[2]Defense Acquisitions: Reduced Threat Not Reflected in Antiarmor Weapon Acquisitions (GAO/NSIAD-99-105, July 22, 1999).

Results in Brief

The combat capabilities of the JSOW antiarmor and unitary variants are expected to be significantly less than originally projected because they have limited ability to hit moving targets or targets whose geographical coordinates are not known in advance. Most of the intended targets for both the unitary and antiarmor variants are moving or relocatable.[3] The wide-area variant will have similar constraints, but its utility is less affected because most of its primary targets are stationary. The attainment of JSOW's required capability to hit moving or relocatable targets from standoff ranges was postponed following operational tests of the wide-area variant, an operational assessment of the antiarmor variant, and a fundamental redesign of the unitary variant to reduce costs. Although the requirement remains, upgrades to the aircraft targeting systems, or enhanced availability of third-party targeting, will be needed to achieve that capability. However, such upgrades will be costly, and the requirement for JSOW to use self or third-party targeting has been deferred to a later, undefined date.

According to DOD, all JSOW variants are still expected to be effective in hitting certain fixed targets and targets whose geographical coordinates are known in advance. However, since quantity requirements are based, in part, on the number of intended targets, the limited capability available to target moving or relocatable targets from standoff distances should reduce the quantity of weapons required. For example, the unitary variant's inability to hit moving targets or targets whose geographical coordinates are not known in advance will reduce its intended targets, as detailed in the 1998 capabilities-based munitions requirements analysis,[4] by over 90 percent. Therefore, far fewer missiles would be needed to attack the remaining targets.

The Navy and the Air Force have not updated JSOW's cost and operational effectiveness analysis since postponing the attainment of the required capability to hit moving and relocatable targets. JSOW's reduced capabilities have not eliminated all of the advantages of the weapon, but they have decreased its utility and flexibility and made it more comparable

[3]Relocatable targets are also referred to as short-dwell targets, such as artillery and mobile surface-to-air missile launchers.

[4]The services use the capabilities-based munitions requirements process to determine how many and what type weapons are needed to fully support war plans. The Navy uses Defense Planning Guidance, the Defense Intelligence Agency's Outyear Threat Report, and its non-nuclear ordinance requirements model.

to other weapons. Given its reduced capabilities, a number of existing weapons and weapons being developed might be more cost-effective than the JSOW.

We are recommending that the Secretary of Defense reassess the acquisition plans for the JSOW antiarmor and unitary variants. Specifically, we recommend that the Secretary reassess the quantities of antiarmor and unitary variants needed to attack stationary targets, revise the procurement and production plans to reflect only those quantities, and based on the reassessment, determine whether the remaining quantities and unit cost continue to make JSOW a cost-effective weapon. We also recommend that the Secretary of Defense task the Director of Program Analysis and Evaluation to independently review the Navy's projected use of the unitary variant.

Further, we recommend that the Congress consider requiring the Secretary of Defense, in the fiscal year 2001 budget submission, to report on the reassessment of the procurement quantities for the JSOW antiarmor and unitary variants.

Background

Following the 1991 Persian Gulf War, the services identified a need to improve the ability of their aircraft to hit ground targets from greater distances than the guided bombs and missiles then in inventory. JSOW is a joint Navy and Air Force program that grew out of this requirement. It is an air-to-ground glide weapon guided by both an inertial navigation system and the Global Positioning System. Its three variants each use a common body, but each will have a different payload.

- The AGM-154A, or wide-area variant, has been approved for full-rate production. It will dispense combined effects munitions[5] over a wide area for use against airfields, infantry, air defense sites, port facilities, refineries, and stationary vehicles and artillery.
- The AGM-154B, or antiarmor variant, is in low-rate initial production. It will use submunitions[6] to attack heavy armor/tanks, armored personnel carriers; self-propelled artillery; support vehicles; mobile anti-aircraft artillery; mobile surface-to-air missile batteries; and mobile command, control, and communication vehicles.
- The AGM-154C, or unitary variant, is in engineering and manufacturing development. It will contain a 500-pound blast/fragmentation[7] warhead to attack targets requiring accurate hits. Such targets include airfields, industrial and military facilities, logistics systems, rail yards, bridges, and ships.

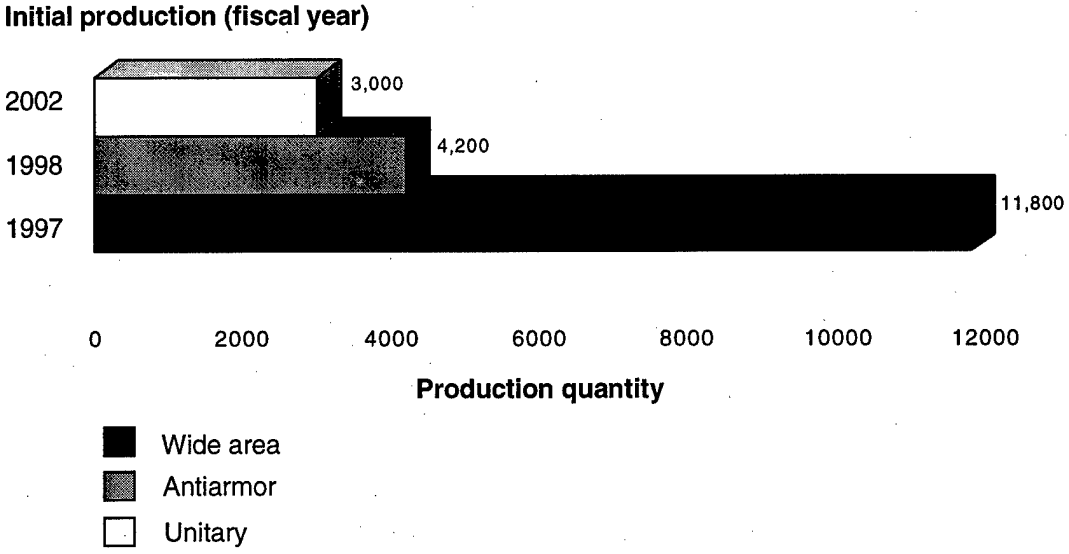
Figure 1 shows the planned quantities and the year production begins for each of the three JSOW variants.

[5]Combined Effects Munition are composed of a small shaped charge for attacking light armor and an incendiary device. The munition also produces fragments for attacking targets such as trucks and personnel.

[6]The BLU-108 submunition was originally designed for the Air Force's Sensor Fuzed Weapon. The antiarmor variant will carry six BLU-108 submunitions. Each BLU-108 contains four projectile warheads that penetrate armor.

[7]A blast/fragmentation warhead explodes into numerous fragments at detonation.

Figure 1: Planned Production Quantities of Each JSOW Variant



Development cost for the three variants is expected to be about $899 million, and total production cost for all three variants is estimated at $5.12 billion. JSOW production is expected to continue through the year 2013.

In our 1998 report,[8] we addressed the affordability and cost-effectiveness of guided weapons in development and production, including the three JSOW variants. We concluded that plans for acquiring these weapons were based on optimistic funding projections; weapon requirements appeared to be inflated; several guided weapon acquisition programs were overlapping; and oversight of guided weapon requirements and acquisition programs needed improvement. We made a number of recommendations to the Secretary of Defense, including reevaluating the planned deep attack weapon acquisition programs in the light of existing capabilities and the current budgetary and threat environment. Although DOD partially agreed with our recommendations, it did not plan to reevaluate its guided weapon acquisition programs.

[8]Weapons Acquisitions: Guided Weapons Plans Need to Be Reassessed (GAO/NSIAD-99-32, Dec. 9, 1998).

Reduced Operational Capabilities Force Changes in Mission Requirements

In a 1994 joint operational requirements document, the Navy and the Air Force identified a mission need for JSOW's three vatiants to attack a variety of targets during day or night and adverse weather operations. The weapon was also required to enhance aircraft survivability by allowing the aircraft to launch JSOW from outside the range of most surface-to-air defense systems. The weapon was designed to attack critical targets, such as air defense systems, early in the conflict to allow rapid transition to low-cost direct attack munitions. In modeling the use of JSOW against targets, most of the projected targets for both the antiarmor and unitary variants were moving targets or targets whose geographical coordinates were not known in advance. However, following operational testing of the wide-area variant, an operational assessment of the antiarmor variant, and a fundamental redesign of the unitary variant to reduce its cost, the Navy and the Air Force revised the document to defer—to an undefined date—the attainment of the capability to attack moving armor or other relocatable targets from standoff distances using self-targeting. Although the need to hit moving targets at standoff distances remains, upgrades to the weapon and the aircraft will be needed to achieve that capability. As a result, the three JSOW variants will be limited to the attack of stationary targets.

Current Targeting Capabilities Limit JSOW Employment Against Targets

In attacking moving or relocatable targets, accurate and projected target location information is required before JSOW is launched. In operational testing of the wide-area variant and an operational assessment of the antiarmor variant, the Air Force and the Navy found it difficult to provide this information for employment of these weapons from standoff ranges. The limitation affects the antiarmor variant extensively since its primary targets are moving. The wide-area variant is less affected because most of its primary targets are at fixed locations. Target location coordinates are passed to JSOW via three modes: (1) preplanned targeting with precise coordinates already identified, (2) third-party targeting using off-board command and control sources such as the Joint Surveillance Target Attack Radar System, and (3) self-targeting via onboard aircraft sensors.

Self-targeting is the primary delivery mode against moving targets such as tanks, infantry fighting vehicles, and self-propelled and air defense artillery. Aircrews use self-targeting when precise target data is not available prior to reaching the JSOW launch area. In this mode, the aircraft's sensors determine target coordinates and pass the coordinates to JSOW.

To effectively employ JSOW at standoff ranges against moving targets, it must have very precise coordinates that have been updated near the time of the weapon's launch. However, a 1996 operational assessment of the antiarmor JSOW by the Air Force Operational Test and Evaluation Center expressed concern that combat air forces could not provide these precise coordinates in a timely manner against moving targets. It concluded that coordinates provided by onboard aircraft sensors and offboard third-party systems may not allow the services to effectively employ the antiarmor variant as anticipated. For example, the report stated that using self-targeting by the F-16 from standoff ranges did not appear to be a valid targeting method for the weapon at that time. The test data indicated that the F-16 radar provided target coordinates so inaccurate that the weapon could hit the ground before its submunitions dispensed. In addition, third-parties, such as the Joint Surveillance Target Attack Radar System and forward air controllers, were needed to update target coordinates but might not always be available. In a tactics guide for the employment of JSOW, the Navy reported similar difficulties with using self- or third-party targeting for the F/A-18. Given the lack of self- or third-party targeting, accurately targeting moving or relocatable targets at standoff distances, outside the range of surface-to-air missiles, will not be possible until improvements to the aircraft systems are made or until third-party targeting availability can be assured.

Although the antiarmor variant's capability is significantly less than expected against moving targets, Air Force and Navy officials stated that it could be employed against armor massed in staging areas or halted at choke points. While using the weapon employing these tactics is certainly feasible, JSOW was developed to attack armor moving in formations toward an objective. Moreover, other weapons may also be effective against armor at staging areas or choke points.

Redesign of JSOW Unitary Variant Removes Capability Against Majority of Intended Targets

The original design of the unitary variant included a man-in-the-loop data link to enable the aircrew to guide the weapon all the way to the target and a sophisticated sensor that could be used to refine and select aimpoints for moving or relocatable targets. However, the Navy reduced the cost of the unitary variant by eliminating the data link and replacing the advanced sensor. As a result, it will not have an effective capability against moving targets at standoff ranges. Although designed primarily for attacking fixed targets, the Navy plans to use the unitary variant almost exclusively against moving or relocatable targets.

According to Navy officials, the redesigned unitary JSOW still retains capability against 95 percent of its intended target types. For example, JSOW will retain capability against power distribution, manufacturing, and communication types of targets. However, in analyzing the extent the redesigned unitary variant would be used in comparison to other weapons in warfighting scenarios, the Navy found it would not be used against several of its original target types and sparingly against others. The analysis showed the primary use of the original unitary variant was primarily against moving or relocatable targets—targets that the redesigned unitary will not have an effective capability against from standoff distances. Specifically, the1998 capabilities-based munitions requirements analysis, using a 2005 scenario, showed the Navy would use over 90 percent of the unitary variant's missiles against maneuvering targets such as components of mobile missile sites and advancing armor formations, including towed artillery and air defense guns, trucks, tanks, and mobile surface-to-air missile launchers. A significant number of unitary weapons were expected to be used against trucks.

The Navy's revised 1999 capabilities-based munitions requirement analysis, which reflected the redesigned unitary variant, eliminated 48 percent of the target types identified in the 1998 analysis that required the use of the unitary weapon. Targets such as mobile air defense guns, coastal and theater missile defense sites, and mobile surface-to-air and surface-to-surface missile launchers were eliminated. The revised 1999 analysis, the Navy's most current, also showed that the Navy would expend 84 percent of its unitary weapons to attack mobile artillery, defensive infantry fortifications and small surface craft—all low priority targets. The Navy's cost as an independent variable analysis, completed in September 1998, and used to assist in the redesign of the unitary variant, stated that relocatable land and sea targets are realistic targets when the unitary has the man-in-the-loop capability; but, those targets are not as appropriate when they are to be acquired autonomously as the unitary is currently designed.[9]

[9]As currently planned, the JSOW unitary will receive Global Positioning System updates to its inertial navigation system for enroute guidance; when it is near the target, programmed automatic target acquisition guidance directs the weapon to the target. Preplanned imagery data must be inputted to the automatic target acquisition guidance prior to aircraft launch.

Reduced Capabilities Reduce Mission Expectations

Air Force and Navy operational assessments for the antiarmor variant and the Navy's redesign of the unitary variant have necessitated changes to the joint operational requirements document. The 1994 requirements document stated that the Navy and the Air Force shared a common mission need for an affordable, air-delivered, standoff weapon to be used against specific types of fixed, relocatable, and moving targets in the mission areas of close air support, interdiction, amphibious strike, and antisurface warfare. DOD has postponed attainment of JSOW's required capability to attack moving or short dwell targets. This capability is now considered an objective that does not have specific funding or timelines assigned to its achievement. Navy and Air Force officials told us that they moved this capability from an initial requirement to an objective because the capability to attack moving or relocatable targets from beyond the range of most surface-to-air missiles would require the investment of substantial funds, either for aircraft onboard sensors or inclusion of a man-in-the-loop data link. The revised operational concept is to use the JSOW antiarmor and unitary variants against targets at known locations. This concept limits the antiarmor variant's employment from beyond visual range to attacking known or expected armor at choke points or staging areas. It also limits the unitary variant to attacking fixed infrastructure targets.

DOD Has Not Updated JSOW's Cost and Operational Effectiveness Analysis

The Navy and the Air Force have not updated JSOW's cost and operational effectiveness analysis since postponing the attainment of the capability to hit moving and relocatable targets. As a result, the services do not have current, updated analyses on which to base decisions about (1) the continued cost-effectiveness of the weapon or (2) the quantities of weapons needed.

The current JSOW operational effectiveness analysis was completed in 1995. The analysis was based on targeting modes and methods of employment that are no longer anticipated for JSOW. As noted earlier, the antiarmor and unitary variants' capability against moving or relocatable targets from standoff distances is significantly less than originally expected. These were primary JSOW targets.

JSOW's reduced capability has not eliminated all of its advantages, but it has decreased JSOW's utility and flexibility and made JSOW less unique among competitors. Although, in a briefing to the Joint Requirements Oversight Council, the Navy identified alternatives for attacking the moving or relocatable targets removed from the JSOW target set, the Council did

not require a cost and operational effectiveness analysis of these and other alternatives to determine their potential for replacing the unitary variant before approving the redesigned program.

Given the reduced capabilities of the antiarmor and unitary variants, a number of existing weapons, as well as weapons currently being developed, could be more cost-effective alternatives. For the antiarmor variant, alternatives include the Air Force's Sensor Fuzed Weapon/Wind Corrected Munitions Dispenser and the Maverick missile, which are both short-range antiarmor weapons already in inventory. The Air Force has informally compared the Sensor Fuzed Weapon/Wind Corrected Munitions Dispenser and the antiarmor JSOW. Both weapons use the same antiarmor submunition, although the Sensor Fuzed Weapon carries more. The Air Force analysis showed a significantly larger number of kills per sortie for the Sensor Fuzed Weapon/Wind Corrected Munitions Dispenser compared to JSOW's antiarmor variant, but with a slight increase in potential aircraft attrition. However, the JSOW's somewhat lower attrition was based on the expectation that it would be able to hit targets at further standoff ranges. Air Force analysts stated that they did not factor the shorter standoff range for JSOW necessitated by using the self-targeting mode into their analysis. As the aircraft flies closer to the target area, its vulnerability to attrition increases. Additionally, they did not consider what effect the larger payload of submunitions carried by the Sensor Fuzed Weapon/Wind Corrected Munitions Dispenser would have on the number of sorties required to defeat an armored force.

Alternatives to the unitary variant include the Navy's Standoff Land Attack Missile-Expanded Response, a long-range missile currently in production, and the Joint-Air-to-Surface-Standoff Missile, a long-range missile now in development. In addition to these weapons, which have larger warheads and more standoff than the unitary variant, the services have improved the all-weather capability of existing laser-guided munitions with the addition of the Global Positioning System for attacking fixed targets. Further, the Air Force has AGM-130s in its inventory, a weapon whose capabilities are very similar to the JSOW unitary. AGM-130 has a 2,000-pound blast/fragmentation warhead, larger than JSOW's unitary variant, deliverable from outside of mid-range air defense missile systems. The AGM-130 also has a data link for final aimpoint selection.

The Navy's Service Acquisition Executive waived the requirement to prepare an updated cost and operational effectiveness analysis as a part of the process leading up to the low-rate initial production decision for the

JSOW antiarmor variant. Similarly, DOD did not direct an analysis of the unitary variant before approving the redesigned program in 1998.

Conclusion

Until aircraft self-targeting or third-party targeting capabilities are improved, the use of the antiarmor variant will be limited to the attack of stationary armor targets at choke points or staging areas. As a result, the currently planned acquisition quantities should reflect the requirement to attack stationary targets. Should self or third-party targeting at standoff ranges become available, quantities could be reevaluated to provide for attack of moving and relocatable targets. Further, JSOW's limited capability makes it comparable to a number of existing and emerging weapons that may be more cost-effective. Its original mandate included the attack of moving armor targets.

Additionally, despite its claimed capabilities, the Navy plans to use the unitary variant against targets that it will have limited capability to defeat or that are low priority. For example, the Navy planned to use over 90 percent of the available unitary variants against maneuvering targets. The redesigned unitary variant will have little capability to effectively attack those types of targets.

As we noted in our 1998 report on guided weapons, decisions about the aggregate requirements for countering targets with guided weapons must be based on analysis and sound military judgment. Considering the test results for the antiarmor variant, the design changes for the unitary variant, and the resultant changes to the operational requirements document, DOD needs to reassess whether these two variants are still cost-effective compared to alternatives and, if cost-effective, the quantities of each variant needed.

Recommendations

We believe the acquisition plans for the JSOW program need to be reassessed because the targeting limitations of the antiarmor variant and the design changes of the unitary variant prevent their effective use against moving or relocatable targets. Consequently, these limitations restrict them to attacking only stationary targets. As a result of the reduction in the number of targets, we recommend that the Secretary of Defense reassess the quantity of antiarmor and unitary variants that are needed to attack stationary targets and revise the near-term procurement plans to reflect only those quantities. Based on the reassessment, we recommend that the

Secretary determine whether the remaining quantities and unit cost continue to make JSOW a cost-effective weapon.

To assist DOD in its assessment, we recommend that the Secretary of Defense task the Director of Program Analysis and Evaluation to independently review the reasons for the unitary variant's projected use against low-priority, moving and relocatable targets as well as why it is not selected for use against high-value targets in the capabilities-based munitions requirements process.

Recommendation to the Congress

We recommend that the Congress consider requiring the Secretary of Defense, in the fiscal year 2001 budget submission, to report on the reassessment of the procurement quantities for the JSOW antiarmor and unitary variants.

Agency Comments and Our Evaluation

In commenting on a draft of this report, DOD did not concur with our original recommendation to defer production and development of the JSOW antiarmor and unitary variants until the quantity requirements and the need for the weapons, considering reduced capabilities and projected usage, could be reassessed in an analysis of alternatives. DOD stated the report does not give the Department credit for implementing cost-savings initiatives and developing joint programs. DOD further stated that the limitations on self-targeting were not significant because delivery platforms for JSOW are expected to achieve such a capability in the near term and that the B-1 and B-2 already have the capability to obtain coordinates at standoff ranges in excess of the Maverick and Wind Corrected Munitions Dispenser weapons. DOD also stated that the unitary variant's capability is nearly identical to that of the previous design. DOD did not agree that maneuvering (moving or short dwell) targets were a primary capability of the unitary variant and stated that redesign of the variant led to target reductions of only about 5 percent from its original target set. DOD commented that the warfighters in the Persian Gulf stated that JSOW is the best weapon available for relocatable targets.

In considering DOD's comments, we agree that an analysis of alternatives is not necessary because neither the antiarmor variant nor the unitary variant is—at least not in the near term—a viable alternative to other weapons that can attack moving or relocatable targets. Accordingly, we have refocused our recommendation to emphasize the need for DOD to reassess the

quantities of the antiarmor and unitary variants needed for use against stationary armor at choke points and against fixed, infrastructure targets and determine the cost-effectiveness of producing the reduced quantities. Also, to assist DOD in its reassessment, we are now recommending that the Director, Program Analysis and Evaluation, independently review the reasons why the unitary variant was not selected for use against high-value infrastructure targets.

In our opinion, efforts to maintain affordability and move toward joint programs, while in themselves commendable, are not a valid basis for proceeding with procurement when reduced capabilities and requirements may no longer make the system cost-effective. Further, DOD's statement that aircraft self-targeting at standoff ranges is a near-term capability is not shared by the aviation community. Air Force and Navy officials told us that such capability would require the commitment of substantial funding that is not in current budget planning. Similarly, Air Force officials told us that the B-1 and B-2 would need additional upgrades to self-targeting systems to provide targeting information necessary for attacking moving targets from standoff ranges.

We do not believe the capability of the redesigned unitary variant is nearly identical to the original design. As we reported, the new design limits the ability of the unitary weapon to attack moving or relocatable targets because it now requires extensive preplanning to transfer imagery data to the weapon. The Navy-sponsored cost as an independent variable analysis determined that only the unitary JSOW with the data link could adequately attack moving targets or those that could move between the time the target is located and the weapon, after it is launched, transitions to terminal guidance. In addition to what we stated in the report, we found the new design limits the crew's capability to (1) find and attack key components in a target area, such as an air defense site or targets hidden in clutter; (2) compensate for target error; and (3) provide close air support. The redesigned variant also lost the capability of bomb impact assessment when the man-in-the-loop was removed (this capability is now an objective requirement). As a result, the aircrew will not be able to positively identify the target and assess whether the weapon hit the target. We do not agree with DOD's statement that maneuvering (moving or short dwell) targets were not a primary capability of the unitary variant, nor do we agree that the targets removed for the unitary variant's target list constituted only a 5-percent reduction. As explained in the report, our analysis of the planned usage of that weapon in two major theaters of war showed that over 90 percent of the targets planned for unitary variant in an 1998 analysis

were maneuvering targets. Only a few weapons were projected to be used against fixed, infrastructure targets. Further, the 1999 capabilities-based munitions requirements analysis showed that 84 percent of the JSOW unitary weapons are planned to be expended either against relocatable land and sea targets or defensive infantry fortifications,[10] which are not high-value targets. In addition, 48 percent of the target types listed in the 1998 analysis were eliminated from the 1999 analysis.

Also, testimony by Persian Gulf warfighters on JSOW performance against relocatable targets refers to the wide-area variant, not the antiarmor or unitary variant discussed in this report.

In addition, we added our analysis of the Navy's 1999 capabilities-based munitions requirements analysis (p. 8) to our report. This analysis was provided to us after our review was completed.

Scope and Methodology

To determine whether JSOW's reduced operational capabilities will meet continuing mission needs, we examined mission needs documents, performance requirements documents, production schedules and test schedules, plans, tactical guides, results of operational assessments, and operational test reports. To determine whether the services have reassessed JSOW's effectiveness compared to other weapons, we reviewed performance requirements documents, acquisition plans, test results, cost data, and cost and operational effectiveness analyses, contractor cost analyses, and effectiveness analyses. To complete both objectives, we interviewed officials from the Navy, the Air Force, the Office of the Secretary of Defense, and Raytheon Systems Corporation concerning JSOW requirements, mission needs, performance, acquisition, and alternatives to JSOW.

We visited the following locations:

- Office of the Secretary of Defense, Program Analysis and Evaluation, Washington, D.C.;
- Office of the Under Secretary of Defense for Acquisition and Technology, Washington, D.C.;
- Naval Air Systems Command, Patuxent River, Maryland;

[10]Defensive infantry fortifications are considered maneuvering targets in the Navy's capabilities-based munitions requirement analysis.

- Air Combat Command, Langley Air Force Base, Virginia;
- Aeronautical Systems Center, Eglin Air Force Base, Florida;
- Navy Aviation Requirements Branch, Washington, D.C.; and
- Raytheon Systems Corporation, Lewisville, Texas.

We performed our review from September 1998 to June 1999 in accordance with generally accepted government auditing standards.

We are sending copies of this report to other interested congressional committees; the Honorable William S. Cohen, Secretary of Defense; the Honorable F. Whitten Peters, Secretary of the Air Force; the Honorable Richard Danzig, Secretary of the Navy; General James L. Jones, Commandant of the Marine Corps; and the Honorable Jacob J. Lew, Director, Office of Management and Budget. We will also make copies available to others upon request.

If you or any of your staff have any questions concerning this report, please call me on (202) 512-4841. Key contributors to this report were Tana M. Davis, William J. Gillies, William R. Graveline, and Carol T. Mebane.

Sincerely yours,

Henry L. Hinton, Jr.

Henry L. Hinton, Jr.
Assistant Comptroller General

Comments From the Department of Defense

Note: GAO comments supplementing those in the report text apears at the end of this appendix.

OFFICE OF THE UNDER SECRETARY OF DEFENSE

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ACQUISITION AND TECHNOLOGY

16 JUL 1999

Mr. James F. Wiggins
Associate Director, Defense Acquisition Issues
National Security and International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Wiggins:

See pp.12-13.

This is the Department of Defense (DoD) response to the General Accounting Office (GAO) draft report, "DEFENSE ACQUISITIONS: Reduced Operational Effectiveness of Joint Standoff Weapon", dated May 11, 1999 (GAO Code 707378/OSD Case 1814-X). The Department has reviewed the report and non-concurs with the report recommendation to defer production and development of the Joint Standoff Weapon (JSOW) anti-armor (BLU-108) and Unitary variants. Affordability is a key tenet of all of the Department's programs. The JSOW cost-reduction programs established on the Baseline and BLU-108 variants, as well as the recent "Cost As an Independent Variable" activities on Unitary, are examples of the affordability focus. This report does not give credit to the Department for implementing cost-savings initiatives and for successfully developing joint programs. Further, the report implies a preference for non-joint programs by an inappropriate comparison of capabilities to service-unique weapons. The Department's position is to support joint programs. Exceptions to this policy must be supported by strong affordability considerations and/or Service-unique imperatives. Even the GAO[1] suggests the Department needs to do a better job in supporting joint programs.

See comment 1.

See p. 13.

The GAO report criticizes the Department for not requiring the preparation of an analysis of alternatives (AoA) for the JSOW anti-armor variant "considering limitations in the capability of the weapon to counter maneuvering targets at standoff ranges." The Department maintains that the cost and operational effectiveness analysis (COEA) conducted in 1995 is still valid. Therefore, an AoA is neither warranted nor required at this time. JSOW is the first of several weapons to be fielded in the next few years that will have a self-targeting capability – update target coordinates using the launch aircraft radar – and can attack maneuvering armor from standoff distances. The various delivery platforms being integrated with JSOW have plans to achieve self-targeting capability in the near term. The B-1 and B-2 currently have the capability to obtain target coordinates at standoff ranges in excess of the Wind Corrected Munitions Dispenser or Maverick weapons. JSOW will attack the coordinates programmed regardless of the source of those coordinates – preplanned, third party, or self-targeting.

See comment 2.

See pp. 12-13.

See comment 3.

[1] GAO Report "WEAPONS ACQUISITIONS" dated December 1998

See pp. 13-14.

The GAO report also criticizes the Department for failing to require or prepare an AoA "based on significant changes in the capability of the redesigned JSOW Unitary variant." Although there are significant changes in the physical and functional *configuration* of the redesigned JSOW Unitary variant, the weapon's *capability* is nearly identical to that of the previous design. The GAO report expresses concern that the redesigned JSOW Unitary variant does not have the capability to attack maneuvering targets, and implies that such targets were a primary capability of the previous design. However, the removal of targets from the Unitary target list constitutes only a 5% reduction in the Joint Operational Requirements Document target set. The current munition requirements are based on the capabilities of the redesigned JSOW Unitary variant. The redesigned weapon has the same effectiveness at half the cost of the previous design. The original COEA did not include mobile targets in its target set. Further, the original COEA findings that the JSOW Unitary variant is the cost-effective alternative for standoff outside of point defense attacks remain valid. In February 1999, the Joint Requirements Oversight Council validated the requirements for the redesigned JSOW Unitary. The alternatives proposed by the GAO are more expensive than the JSOW Unitary variant. Regardless of their cost, each of the alternatives to the JSOW Unitary variant is intended for a different group of targets than is JSOW. The GAO would, in effect, penalize the Department for implementing cost saving initiatives by recommending postponement of procurement and development while a costly AoA is conducted.

See comment 4.

See comment 5.

See comment 6.

See comment 7.

The Department non-concurs with the GAO report recommendation to defer JSOW production and development. This recommendation is based on incorrect assumptions that the capabilities are reduced and requirements have changed. The current COEA remains valid, the Joint Requirements Oversight Council has repeatedly validated the requirements, and adjustments to quantities are made annually, and as part of the Milestone review process. Testimonies coming from warfighters in the Gulf state that JSOW is the BEST weapon available for re-locatable targets, and that JSOW has become part of the standard loadout. It would be imprudent for the Department to defer or reduce procurement or development by any measure, given the recent demonstrated need for standoff and precision strike capabilities, and the critical shortfall of these types of weapons in the inventory.

See comment 8.

See p. 14.

Attached is the Department's response to the draft report recommendations. The security review and the classified detailed comments were provided separately. The Department appreciates the opportunity to comment on the draft report.

Sincerely,

George R. Schneiter

George R. Schneiter
Director
Strategic and Tactical Systems

Attachment

GAO DRAFT REPORT - DATED MAY 11, 1999
(GAO CODE 707378/OSD CASE 1814-X)

"DEFENSE ACQUISITION: Reduced Operational Effectiveness of Joint Standoff Weapon"

DOD COMMENTS TO THE GAO RECOMMENDATIONS

(U) **RECOMMENDATION**: "The GAO report recommends that the Secretary of Defense defer future production and development for the anti-armor and Unitary variants of JSOW until the Secretaries of the Navy and the Air Force jointly provide an analysis of alternatives for the anti-armor and Unitary variants. The analysis should determine 1) whether JSOW is the most cost-effective weapon for meeting the mission need, and 2) the quantity of each variant needed. The analysis should be used by the Department of Defense to determine whether the anti-armor and Unitary variants of JSOW should be canceled."

(U) **DOD RESPONSE**: The Department non-concurs with the recommendation to defer JSOW production or further development. This recommendation is based on assumptions that the capabilities are reduced and requirements have changed. These assumptions are incorrect. The existing COEAs remain valid, the Joint Requirements Oversight Council has repeatedly validated the requirements, and the Department adjusts quantities as needed to support the warfighter. Further, the JSOW BLU-108 and Unitary variants are currently in low-rate initial production and E&MD respectively. Given the recently demonstrated need for standoff and precision capabilities and the current shortfall of these types of weapons, it would be imprudent for the Department to defer or reduce the procurement and development efforts by any measure.

See pp. 12-13.

The following are GAO's comments on the Department of Defense's (DOD) letter dated July 16, 1999. DOD also provided classified detailed comments, which are not included in this report.

GAO Comments

1. We believe that the primary emphasis must be on making the most effective and efficient use of resources to provide theater commanders the capability needed to accomplish their mission whether they are joint or service-unique weapons. In the case of the antiarmor and unitary variants of the Joint Standoff Weapon (JSOW), similar capabilities are present in weapons already procured such as the Sensor Fuzed Weapon with Wind Corrected Munitions Dispenser for armored targets and in the AGM-130 and the Standoff Land Attack Missile-Expanded Response for stationary targets. Also, the JSOW unitary weapon is not being procured jointly. Only the Navy is buying it.

2. JSOW requirements have changed and capabilities have been reduced since the 1995 cost and operational analysis was performed. As we point out in the report, the Navy and the Air Force revised the joint operational requirements document after operational testing of the wide-area variant by both the Navy and the Air Force and an operational assessment of the antiarmor variant by the Air Force' s operational test community. The 1996 testing showed that self-targeting and third-party targeting were not mature options at that time, but the 1995 cost and operational effectiveness analysis assumed the full capability of JSOW's self and third-party targeting and measured alternatives against those mature capabilities. Antiarmor and unitary variants, using preplanned targeting, will be able to effectively attack only stationary targets—a more limited target set than anticipated earlier.

3. We agree that all three JSOW variants can attack targets with known coordinates. Our point is that JSOW's ability to hit moving or relocatable targets, the primary targets for both antiarmor and unitary variants, is limited because of the difficulty in providing JSOW with the necessary coordinates in a timely manner.

4. Although the 1995 cost and operational effectiveness analysis did not model the use of the unitary weapon against maneuvering targets, the Navy's cost as an independent variable analysis modeled the unitary weapon in its original configuration against maneuvering targets. Further, as we discussed, the Navy's planned usage of the unitary weapon is overwhelmingly against maneuvering targets.

5. We agree that the standoff provided by such weapons as Sensor Fuzed Weapon with the Wind Corrected Munitions Dispenser is less than the standoff potentially provided by JSOW. However, given the current limited targeting capabilities, neither the antiarmor or the unitary variant will be effective against these primary targets and cannot ensure the minimizing of collateral damage from standoff distances. While cost and standoff range are important in selecting a specific weapon to use against a target, weapon effectiveness and minimizing collateral damage are also important. Further, as we stated in our report, an Air Force analysis did not show significant differences in aircraft attrition in a comparison of the two weapons, even assuming a greater standoff range for JSOW.

6. The Navy briefed the Joint Requirements Oversight Council that the redesign of the unitary variant would reduce JSOW's original target base by about only 5 percent while reducing the cost of the unitary variant. However, 48 percent of the target types listed in the Navy's 1998 capabilities based munitions requirements analysis were eliminated from the 1999 analysis. Still, the Navy planned to use the weapon over 80 percent of the time against maneuvering targets.

7. As we reported, the Navy now plans to use the unitary variant primarily against artillery and defensive infantry fortifications designated as less critical targets. There are other alternatives to the unitary variant for attacking infrastructure targets, such as AGM-130, Standoff Land Attack Missile-Expanded Response, and the Joint-Air-to-Surface-Standoff Missile; however, they are more expensive than the unitary variant. All three alternatives are precision-guided munitions with larger warheads. In addition, the Standoff Land Attack Missile-Expanded Response, and the Joint-Air-to-Surface-Standoff Missile have significantly greater standoff ranges than the unitary. Alternatives for attacking less critical targets, including the Joint Direct Attack Munition and the laser guided bombs, are less expensive and potentially more lethal. The Navy's capabilities-based munitions requirement analysis identified (1) a number of alternative weapons to attack the targets the Navy feels JSOW is suited to attack and (2) the Standoff Land Attack Missile-Expanded Response to attack the same type of targets the Navy contends the redesigned JSOW unitary is intended to hit.

8. DOD's annual adjustments to quantities is the result of the capabilities-based munitions requirement process. This process identifies the types of munitions that will be used to attack targets in two theaters of war. The process provides an estimated quantity of munitions to defeat a

specified threat with a given force structure. The services compute their munitions requirements through individual methodologies that include common probabilities of kill and munitions effectiveness to attack these targets. In the end, the capabilities-based munitions requirement analysis computes the total combat requirements by major theater of war. The Navy's methodology has weapons competing with other weapons. It selects the most combat effective weapon during periods of high attrition while also considering the cost of the weapon for the medium and low attrition periods. According to the Navy official responsible for the Navy's munition's analysis, the unitary variant was not selected to attack many of its potential targets because other weapons were considered more effective.